QUESNEL HIGHLANDS WOLF CONTROL PROJECT

Ministry of Environment and Parks
Williams Lake, B.C.

Wildlife Working Report No. WR-26
January 1987

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by

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INTRODUCTION

BACKGROUND

A 2-year study in the Quesnel Highlands area (Figure 1) has shown that caribou productivity is directly linked to the presence or absence of wolves (Seip and Hebert 1984; Seip 1985, 1986). This caribou population is estimated at approximately 150 animals and is important because its location is within the southern limit of moderate caribou densities in British Columbia (B.C. Ministry of Environment 1979). Wolves could potentially eliminate this population because they control calf survival and adult mortality has averaged 25-30% for two years.

The area is currently slated for increased logging as access becomes available east of the North Arm of Quesnel Lake. Present and future logging will increasingly impact early winter and winter range habitats. To maintain these habitats for caribou in the face of logging, the predation factor that is currently limiting their numbers must be overcome.

The Ministry will have difficulty justifying the retention of unlogged caribou habitat if, because of wolf predation, caribou cannot use or underutilize the habitat currently being reserved from logging. Preliminary estimates of lichen abundance on the late winter range indicate that at least three times more caribou could be supported by the available food supply (D. Seip, pers comm).

The project will also provide information on the survival of moose calves when wolves are removed from a critical moose winter range. Calf-cow ratios were 11 calves/100 cows in the Cariboo River drainage in 1985. Elsewhere in the region, this ratio is about 45 calves/100 cows. This proposed wildlife management area is currently a moose-habitat study area for a Habitat Conservation Fund (H.C.F.) habitat improvement project. Removal of wolves will allow the full benefits of this enhancement project to be realized. At present there are six radio-collared moose in the study area and an additional three collars will be placed on moose this winter (86/87).

Wolves will be monitored but not controlled in the Quesnel block. Wolves in this area will be radio-collared to determine pack size, range of movements, and dispersal and it will act as a buffer zone adjacent to the control areas. Since the wolf control area is not large, it will be necessary to monitor wolf populations in the surrounding area.

The Wells Gray Park area is also part of the caribou study area. Currently 20 caribou are radio-collared in the Park and will be studied for the next 3 years. During the winter, spring and summer of 1986-87, wolves will be radio-collared in the park to determine the interaction of wolves and caribou in that area. R. Ritcey

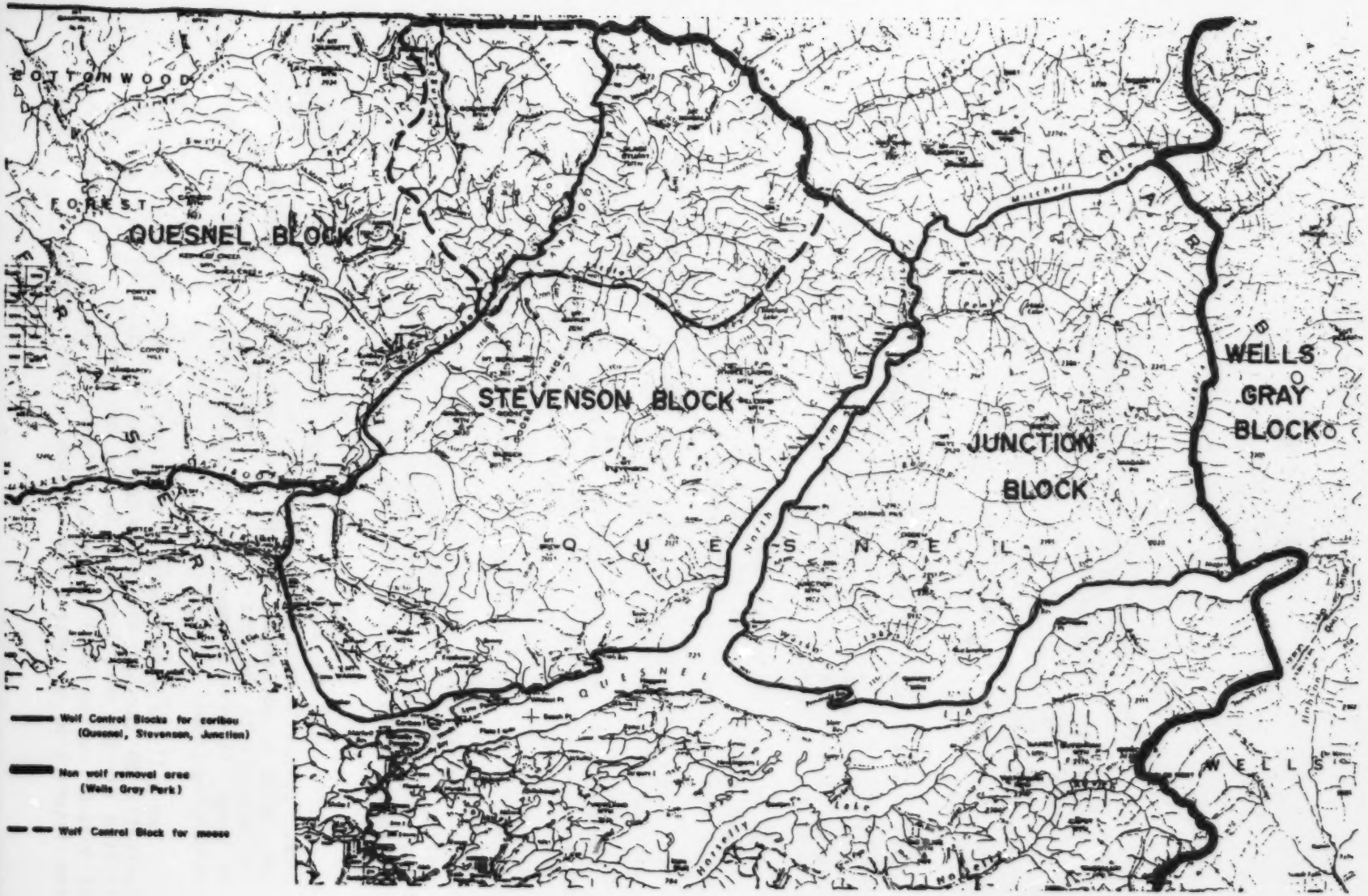

Figure 1. The study area showing the wolf control and non removal areas in the Quesnel Highlands.

estimates that two packs or about twelve wolves occur within the park.

OBJECTIVES

1. The primary objective is to prevent extreme declines in the caribou populations of the Stevenson and Junction blocks by reducing wolf densities from 1 per 140 km^2 to 1 per 700 km^2.

2. A secondary objective is to assess the impact of this wolf removal on moose calf survival. Thus a management program could be developed for wolves, moose, and caribou.

The levels of wolf reduction are detailed on page 4 of this proposal.

No wolf removal will take place in Wells Gray Park or in the Quesnel block, so caribou numbers and calf survival can be compared to those in the removal areas. Wolf numbers will be monitored and additional wolf control may be required over the course of the project if their numbers increase above 1 per 700 km^2.

The objective for caribou follows directly from the first provincial objective for caribou management, which is to increase numbers to at least 20,000 animals distributed on traditional ranges. An increase in caribou numbers in the Quesnel Highlands is also identified in the draft regional plan as a high priority.

STUDY AREA

The study area lies north of Quesnel Lake and includes Wells Gray Park to the east (Figure 1). The area is mountainous and encompasses three biogeoclimatic zones (alpine tundra, Engelmann spruce-subalpine fir, and interior cedar-hemlock). The total area of the Stevenson and Junction blocks is 2100 km^2. Elevations range from 728 m at Quesnel Lake to 2606 m at Niagara Peak. The Wells Gray Park control area is approximately 5300 km^2. The Quesnel block is approximately 1280 km^2. The Cariboo River area is approximately 661 km^2.

BIOLOGICAL DATA

The caribou population estimate for the Stevenson and Junction block study area is about 150 (Seip 1986). This has been determined using 20 radio-collared caribou over a 2-year period. Marked to unmarked ratios have been replicated over three seasons: summer, fall and late winter. Calf survival (radio-collared cows with calf) has been determined for 3 years and will be determined in June, September and March to indicate any population change caused by the wolf removal program.

The caribou study area is divided in half by the North Arm of Quesnel Lake. No movement of radio-collared caribou occurred across

this barrier during 1984 or 1985, which produced a very convincing natural experiment to show conclusively that wolves eliminate all or most recruitment (see Table 1) when they are present during and after the calving period. At least two authors have substantiated this effect on caribou populations elsewhere in North America (Bergerud 1984; Gasaway et al. 1983). The project is designed as an operational trial to take advantage of the knowledge that wolves are limiting recruitment and that considerable areas of unoccupied or lightly used habitats are available.

Moose have been implicated in the demise of caribou elsewhere in North America. The relatively recent colonization of moose in the Quesnel Highlands which occurred in the early 1900's (from Hatter 1950) follows closely the scenario proposed by Bergerud (1974) in which he suggests that moose provided the alternate food resource which allowed wolves to increase within caribou ranges. Calf survival rates are also low for moose. A winter survey of the Cariboo River drainage in 1985 showed less than 11% of the female segment of the moose population with calves. Wolf radio-collar information (2 years) concludes that movement of wolves in the winter overlaps completely with moose winter range use. Food habits work indicates a high proportion of moose in the winter diet of wolves. In addition, radio-collared moose use the mid-elevation riparian or wetland communities during the summer. Seip (1986) has shown that caribou and moose summer at similar elevations and that heavy predation of adult and calf caribou by wolves will lead to a severe reduction in the population. In addition, movement of caribou to low elevation early winter ranges and spring ranges, increases mortality by wolves (Seip 1986). Incidental predation on caribou adults (or calves) when wolves are hunting a relatively high density moose population could result in the extirpation of caribou and no doubt accounts for their present low densities. Table 2 summarizes the known causes of caribou mortality over the course of the study.

THE PROGRAM

EXTENT AND DURATION

The program would attempt to remove approximately 12 wolves from the Stevenson and Junction blocks. Wolf densities will be reduced from 1 per 140 km^2 to about 1 per 700 km^2 (or from an estimated 15 wolves to 3). Replacement of the removed wolves will likely occur from adjacent areas and additional removal may be required in the second or subsequent years of the program to maintain desired densities. The Quesnel block will be monitored for wolf distribution and no wolves would be trapped unless movement into the Stevenson blocks occurred. No wolves will be trapped in Wells Gray Park. Thus, approximately 80% of the wolves will be removed from 22% of the

Table 1. Caribou calf survival in the Quesnel Lake study[a]

Date			Cows counted	% cows with calves	Collared cows	% cows with calves
1984	June	(wolves present)	28	39	13	38
	October		36	< 11	14	0
1985	June	(all areas)		55	17	65
	October	(wolves present)			6	0
	October	(wolves absent)			9	56

[a] from Seip (1986)

Table 2. Sources of adult caribou mortality in the Quesnel Lake study[a]

Year	Predation			Starvation	Avalanche	Unknown	Total
	Wolves	Bear	Unknown				
1984	1	1		2[b]			4
1985	2	1			1[c]	1	5
1986			1				1

[a] from Seip (1986)

[b] Predisposed by accident or predator avoidance to unsuitable habitat.

[c] 4 uncollared caribou also killed.

total study area. Additional removals may be required in the Cariboo River block to reduce movement of wolves into the Stevenson block and to reduce predation on the moose using the area as winter range. The program would run for a minimum of 2 years. Wolves would be controlled during the winters of 1986-87 and possibly 1987-88. Monitoring of the caribou response would occur during the course of the Quesnel Lake study. Changes in the population estimate based on the marked-unmarked ratio and in the number of radio-collared cows with calves should indicate the effectiveness of the program. Survival data for the Wells Gray Park caribou population will be used for comparison. Moose cow-calf ratios would be established during the winter of 1986-87, 1987-88, and 1988-89 in the Cariboo River and other areas during these periods. Radio-collared cows (at least six) will be monitored separately. A total count of the Cariboo River will be made when deep snow conditions are present. Caribou calf survival and wolf numbers will be reassessed periodically for additional control needs.

CONTROL METHODS AND TECHNIQUES

The program can be handled efficiently since radio-collars are currently in place in the major wolf pack utilizing the Junction block. A second pack uses the northwest corner of the study area and is not currently radioed. The current radios have been operating for 2 years and since the wolves moved from the experimental portion of the study area to the control portion, half the study area is without radio-collared wolves. At least three additional radios should be placed on wolves in two or possibly three wolf packs.

Shooting over baits and trapping will be employed as the chief control methods. Six trappers currently operate within the removal area. They will be encouraged to continue or expand their wolf trapping efforts. A contractor may also be employed for this portion of the removal effort. The small number of wolves involved and the proven capability to trap in this area are major advantages of this study area. Aerial shooting may be used if the other techniques are not successful.

Control will be accomplished through winter trapping and possibly aerial hunting where necessary, to remove a few individual wolves (possibly aided by baiting). Both of these techniques can be very specific for wolves and no adverse impact on other species is anticipated.

EXPECTED BENEFITS

The program will provide a basis for the long term existence of the Quesnel Highlands caribou population. Maintenance of caribou habitats and adequate stocking of these habitats will be ensured. Any habitat reserved from logging by Ministry of Forests and Lands for caribou will be more fully utilized.

Wolves will be reduced but not eliminated from the area. The information from the project will allow a long term management

program for wolves, caribou and moose to be designed. Wolves will be maintained in the area and densities may be allowed to increase above 1 per 700 km^2 in the long term.

The current caribou harvest is about three per year and about 94 hunter days are supported. This could be increased to about 15 bulls per year with a population of 300. Increased access will make this higher harvest level feasible and success rates may increase. Reid (1985) values a day spent caribou hunting at $26.40, therefore 225 hunter days would be valued at $5,940. (This assumes that success rates will improve to about 15 hunter days per caribou). The present discounted value of this recreation is $74,250 at an 8% interest rate. If we combine this value with the potential for extirpation of the population then the project is clearly justified. The proposed Cariboo River W.M.A. will be more fully utilized by moose and the feasibility of more extensive control measures elsewhere in the region will be established.

MINISTRY STAFF WORK SCHEDULE

CONTROL	
Wildlife Technician	4 man-weeks per year
A.C.O.	(Dec. - Feb.)
Commercial Trapper	As needed
MONITORING	
Wildlife Biologist	2 man-weeks
Wildlife Technician	(Dec. - Feb.)

BUDGET REQUIREMENTS

	Initial Radios & Trapping	Control	Monitoring	Total Annual
1986-87	$5,000	$4,000	$3,000	$12,000
1987-88		$4,000	$3,000	$ 7,000
1988-89		-	$5,000	$ 5,000
TOTALS	$5,000	$8,000	$11,000	$24,000

PROGRAM EVALUATION

MEANS OF EVALUATING

1. Total caribou numbers will be estimated from annual aerial surveys. The marked to unmarked ratios of radio-collared cows will also allow an estimate of cow numbers. The present estimate was made using the 20 collared caribou to correct the March survey for sightability (Seip 1986). The program will be evaluated against the objective of 300 animals.

2. Caribou calf-cow ratios will be intensively monitored in conjunction with the Quesnel Highland and Wells Gray study. June, September, and March values will be obtained for both radio-collared and unmarked animals.

3. Losses of adult caribou and causes of mortality will be assessed by directly monitoring radio-collared caribou.

4. Changes in moose calf survival will be assessed between years and among areas to indicate the impact of wolf predation on calf survival.

5. Survival rates of caribou in Wells Grey Park, where no wolves will be removed, will be used for comparison.

6. Moose cow-calf ratios will be monitored in the Cariboo River, Niagara River, and north of Quesnel Lake. Total numbers of moose using the Cariboo River will be determined. The survival of calves will also be determined from a radio-collared sample of nine cows. Comparison will be made with moose cow-calf ratios in the Black Creek area (outside the control area and south of Quesnel Lake).

7. Longer term assessments of wolf numbers will also be undertaken.

REPORTING SCHEDULE

Progress Report #1	April 30, 1987
Progress Report #2	April 30, 1988
Project completion report	August 31, 1989

Additional monitoring and reports will be prepared as a follow-up to the project. In addition, progress reports for both the caribou and moose projects will also be available.

ANTICIPATED PUBLIC REACTION

Given the apparently fragile state of this caribou population and the relatively small numbers of wolves that are expected to be involved, no major adverse reaction is anticipated. Groups that oppose wolf control in all forms (at the provincial level) may be expected to voice their opinions.

PROPOSED PUBLIC INFORMATION PROGRAMS

The program will be explained to the public as a part of the Quesnel Highlands caribou study that has thus far produced good results and had little adverse publicity.

Information on the project will be made available to the public on request. The project goes beyond an experimental project and can best be termed an operational trial.

INTERFACE WITH OTHER PROJECTS

As noted above the project will be closely tied to the Quesnel Lake caribou study and to the Cariboo River H.C.F. project.

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Wildlife Working Reports should not be cited because of the preliminary nature of the data they contain

WR-1 Progress report - coastal grizzly research project: Year 1. A.N. Hamilton. First printed October 1984, revised October 1986. 32pp. (Also printed as WHR-9).

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WR-20 Kechika Enhancement Project of northeastern B.C.: wolf/ungulate management. 1985-86 annual report. J.P. Elliott. December 1986. 17pp.

WR-21 Muskwa Wolf Management Project of northeastern B.C. 1985-86 annual report. J.P. Elliott. December 1986. 15pp.

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WR-23 Critical habitats of caribou (Rangifer tarandus caribou) in the mountains of southern British Columbia. K. Simpson, K. Hebert, and G.P. Woods. February 1987. 13pp.

WR-24 Impacts of a hydro-electric reservoir on populations of caribou and grizzly bear in southern British Columbia. K. Simpson. February 1987. 40pp.

WR-25 The effects of snowmobiling on winter range use by mountain caribou. K. Simpson. February 1987. 15pp.

WR-26 Quesnel Highlands wolf control project. D. Hebert. January 1987. 10pp.

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